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In re the U.S. Patent Application of

Tokmulin et al.

Examiner: Rudy Zervigon

Serial No.: 08/860,763

Art Unit: 1763

Date Filed: September 9, 1998

Docket No.: P-9701

For: Device for Treating Wafers with a Plasma Jet

Director of Patents, U.S. Patent Office  
Washington, D.C. 20231

RESPONSE

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SIR:

Applicants, in reply to the Office Action mailed April 8, 2002, make the following response. An extension for responding to the Office Action is respectfully to August 8, 2002. A fee for this extension is enclosed. In the event that this fee is not sufficient, please charge any remainder due to our account no. 10-0100.

The Examiner's comments in the Office Action have been carefully considered. Applicants' undersigned attorney has had a number of telephone conferences with Examiner Zervigon, and the time and courtesies that the Examiner has extended during such conferences is appreciated.

Claims 2, 3 and 5-14 have been rejected under 35 U.S.C. §112 as not satisfying the enablement requirement of this section that would enable one skilled in the art to which

this invention pertains to make and/or use the invention. More specifically, the Examiner points out that both independent claims 2 and 14 discuss holders 14 (Figs. 1 and 4) "having a drive for effecting angular displacement." The Examiner also notes that the specification, at page 6, identifies item 12 of Fig. 1 as "an angular displacement drive" and item 29 as the wafer. Having considered the specification and the drawings, the Examiner has concluded that the specification is not "enabling" under the statute because the operation of the "device for treating wafers" does not provide sufficient teaching of how, and by what means, the wafers to be treated are processed in the manner described by the specification and implied by the drawings." The Examiner takes the position that one skilled in the art would be unable to use the "stated invention" without specific instructions for "maintaining the wafers in a suspended equilibrium without a teaching of gas flow rates and applied forces delivered from below by the plasma jet and from above by the holders. Similarly, the Examiner takes the position that one of ordinary skill in the art would not be enabled to use to use the "stated invention" without "specific instructions for maintaining the wafers in a suspended equilibrium when holder is displaced by an angular distance."

Having carefully considered the Examiner's aforementioned rejections, applicants respectfully traverse the Examiner's rejections and respectfully requests that the Examiner reconsider and withdraw the same, for the reasons more fully discussed below.

The Examiner is correct that the specification describes a device for treating wafers of a plasma jet that uses holders 14 and a drive 12 for effecting angular displacements,

and that these elements are used for handling the wafers 29. Those elements or components are totally consistent with the recitation of a “device for treating wafers with a plasma jet,” when taken together with the remaining elements or components specified in claims 2 and 14. However, applicant respectfully submits that the recitation of such structure, which is directed to the claimed invention, does not have a direct impact on the features or characteristics that the Examiner states are inadequately enabled. In the one case, the elements alluded to by the Examiner are structural elements that form part of the device for treating wafers with a plasma jet. The bases for the Examiner’s rejection are directed, on the other hand, to specific plasma treatment parameters that are not recited in the claims.

The Examiner has quoted, in paragraph 2 on page 2 of the Office Action, the relevant section of the statute, 35 U.S.C. §112 first paragraph. However, it is clear from the statute that a person skilled in the art must be enabled to make and use the “invention,” presumably as defined in the claims.

The Manual of Patent Examining Procedure (MPEP) makes it very clear that the subject matter that must be enabled to one skilled in the art is the invention as it is defined in the claims. MPEP §2164 states: “The invention that one skilled in the art must be enabled to make and use is that defined by the claim(s) of the particular application or patent.”

In fact, the test of enablement is specifically defined in MPEP §2164.01. The test

requires an analysis of whether a “particular claim” is supported by a disclosure that “contains sufficient information regarding the subject matter of the *claims* as to enable one skilled in the pertinent art to make and use the *claimed* invention.” It is respectfully submitted that neither claim 2 nor claim 14 recites or make any reference to maintaining wafers in a suspended equilibrium, gas flow rates and/or applied forces delivered from below by the plasma jet or from above by the holders. Neither are these considerations required in the instance when the holder is displaced by an angular distance.

It is also clear that some experimentation may be perfectly reasonable and acceptable without rendering an invention insufficiently disclosed. In fact, the Court of Appeals for the Federal Circuit has reiterated numerous times that a patent need not teach, and preferably omits, what is well-known in the art. (See decisions cited at the end of MPEP §2164.01, for example.) To the extent that some experimentation might be needed in order to practice the subject invention, the question that must be asked is: Is the experimentation needed to practice the invention undue or unreasonable? That has been, and continues to be, the critical issue in most enablement cases. It does not matter whether the experimentation is simple or complex, if the experimentation is typical of experimentations that are conducted in the relevant art.

In this particular instance, it is respectfully submitted that such experimentation is not “undue” experimentation. The physics of the device are relatively simple and straightforward, and a simple vertical force diagram can easily be used by those skilled in

the art to establish the necessary gas flow rates and applied forces delivered by the

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plasma jet in order to place the wafers in suspended equilibrium. Clearly, if the wafers rise or fall, as opposed to remaining in suspended equilibrium, the necessary adjustments can easily be made in order to equalize the vertical forces so that the total forces acting on the wafers are substantially zero. This may be as simple as adjusting the valve of a gas line to control the flow rate. This is certainly well within the level of those skilled in the art, and typical of the type of experimentation that is conducted in the relevant art.

The Examiner is respectfully directed to claim 7 and specification at pages 7 and 8. For example, in claim 7 it is recited that each vortex chamber is being provided with an open portion located on a level and surface of the wafer holder, coupled through the tangential channel to said gas supply means and located such that resulting vortex flows formed permit the positioning (suspended equilibrium) of each wafer near the holder. The quoted passage positive recites how the wafers are suspended. In other words, mechanically the manner in which the wafers are suspended is described and recited.

In the specification it is stated that through the switching of the gas supply means 4 in vortex chambers 25 of the holder, gas vortex flows are generated to provide for the holding of the wafer 29 at a desired distance from a level end surface of the platform 16 of the holder 14. It would entirely within the realm of experience of one skilled in the art to make the necessary adjustments, which could take a matter of minutes, to practice the invention by an extremely simple adjustment (experimentation) that could by no means be

considered undue or unreasonable.

Not only are the features that the Examiner claims to be insufficient enabled not recited in the claims as being part of the “invention,” but also, it is respectfully submitted, the Examiner has not applied the correct test of enablement. Under MPEP §2164.01(a), it is made clear that in order for the analysis of enablement to be correct, it must consider a plurality of factors, and a single, simple factual determination is not by any means conclusive. All of the required factual considerations must be sufficiently weighed without ignoring one or more of the other factors.

Specifically, it is respectfully submitted that the Examiner has not fully considered the breadth of the claims when he suggests that the claims that define the invention require a teaching of specific gas flow rates and applied forces in order to maintain the wafers in suspended animation. However, the claims do not, as suggested above, make such requirements.

The Examiner fails to consider the nature of the invention when he suggests that what is critical for the invention is a teaching of specific gas flow rates and applied forces in order to maintain the wafers in suspended animation when the invention is clearly directed, as evidenced by the preambles of each of the claim, to a device for treating wafers with a plasma jet. The state of the prior art and the level of one of ordinary skill in the art are apparently not discussed or considered by the Examiner. The Examiner has, it is believed, also failed to consider the level of predictability in the art. As suggested

above, the parameters that the Examiner has questioned are substantially quite simple and rely on very rudimentary principles of physics. A simple, one-dimensional vertical force diagram is all that is required to complete the analysis. Likewise, a simple adjustment of, for example, gas flow rates by adjusting a valve on a gas line could be all that is needed to provide the suspended equilibrium that is questioned by the Examiner. This is well within the realm of those skilled in the art of plasma physics, and those that use sophisticated equipment such as the type under discussion.

It is submitted that the Examiner has likewise failed to take into account the direction that has been provided by the inventor, as referred to above in connection with page 8 of the specification. A specific working example of the “claimed invention” has been given. It is also submitted that the Examiner has failed to quantify the approximate amount of experimentation that would be needed to make or use the invention. Since “suspended equilibrium” is simply based on summing a number of vertical forces and adjusting one or more of such forces in order to provide a net zero force in the vertical direction, it is respectfully submitted that the amount of experimentation that would be needed to provide such suspended equilibrium would be virtually nil, and on the order of magnitude of approximately one minute, at most.

In view of the foregoing, and the Examiner’s failure to consider all of the relevant factors as required by the test to be applied for enablement, it is respectfully submitted that the rejection is wholly inadequate and inappropriate.

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In view of the above, it is respectfully requested that the Examiner's rejections on the basis of lack of enablement be reconsidered and withdrawn. During one of the telephone conferences with the Examiner, the Examiner confirmed that the prior art rejections have been withdrawn.

In the circumstances, it is believed that this application is in condition for allowance. Early allowance and issuance is, accordingly, respectfully solicited.

Dated: August 8, 2002

Respectfully submitted,

Lackebach Siegel, LLP  
One Chase Road  
Scarsdale, NY 10583  
Telephone: 914 723 4300  
MG/as

LACKENBACH SIEGEL, LLP  
Attorneys for Applicant(s)

By:

  
MYRON GREENSPAN  
Reg. No. 25,680

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*I hereby certify that this correspondence is being filed by depositing same in an envelope stamped first-class mail, addressed to the Director of Patents, U.S. Patent Office, Washington, D.C. 20231, in a duly marked U.S. Postal Service drop box, with appropriate postage, on the following date:*

Myron Greenspan

Attorney

Signature

August 8, 2002

Date

*Applicant hereby petitions that any and all extensions of time of the term necessary to render this response timely be granted. COSTS FOR SUCH EXTENSION(S) AND/OR ANY OTHER FEE DUE WITH THIS FEE DUE WITH THIS PAPER THAT ARE NOT FULLY COVERED BY AN ENCLOSED CHECK MAY BE CHARGED TO DEPOSIT ACCOUNT #10-0100.*